



Stock Assessment Science Program Review

Office of Science & Technology Summary and Response – October 2014

Introduction

On September 9-12, 2014, the National Marine Fisheries Service's (NMFS) Office of Science & Technology (ST) hosted a panel of experts to review the national stock assessment program conducted under the auspices of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) as reauthorized in 2006.

This review was the second in a five-yr cycle of thematic annual reviews designed to maximize the transparency and effectiveness of major science programs conducted at NMFS' six Science Centers and those conducted or coordinated by ST. Fish stock assessments are a major endeavor for NMFS that are supported by extensive data collection and scientific activity. The stock assessment program review was conducted over two years, with a focus on data collection and management in 2013 and a focus on the modelling approaches, review processes, and responsiveness to MSA mandates in 2014.

This was not a review of any particular stock assessment, but rather a review of the overall national stock assessment program as coordinated by ST, centered on the following overarching questions from Terms of Reference ([click here](#) for complete TOR):

1. Is ST conducting the right set of activities to support NMFS stock assessments nationally?
2. Is the organization and management of ST's assessment program activities effectively supporting and advancing assessments nationally, and are there recommendations for improvement?

ST staff provided the panel with presentations covering ST's stock assessment program, background material for more in-depth information, and time during the review for detailed discussions with ST management and staff. Comments and responses to questions from the public participants who attended the review were also considered by the panelists.

Acknowledgements

We thank the review panelists who devoted a significant amount of time to prepare for and participate in this review. Their helpful and insightful observations and recommendations provided valuable feedback on how our stock assessment program is performing relative to our stated goals and objectives. The panelists for this review were:

- Jack Dunnigan (Chair) – Retired (National Ocean Service, National Marine Fisheries Service, and Atlantic States Marine Fisheries Commission)
- Mark Dickey-Collas – International Council for the Exploration of the Sea
- Mary Erickson – National Centers for Coastal and Ocean Science
- Pat Livingston – National Marine Fisheries Service
- Bob O'Boyle – Beta Scientific Consulting Inc.

- Bonnie Ponwith – National Marine Fisheries Service

We also greatly appreciate the time and thought that participating stakeholders put into this review; their questions and comments sparked many interesting conversations and generated valuable ideas for consideration.

Finally, we would like to express our appreciation to the ST staff for their contributions, insights, and candor during this review, which spanned 3 ½ days. Several comments in the panelist's reports highlight the fact that an impressive amount of high quality work is being accomplished by a small, dedicated staff. Overall, the staff's efforts directly contribute to maintaining and advancing stock assessment science in NMFS, and the information developed for this review is an excellent example of their commitment.

Remarks

The general feedback provided by the reviewers was overwhelmingly positive. The Chair's summary and the individual reports reinforce and validate the mission, direction, and activities implemented by ST's stock assessment program. The reviewers expressed that the culture and approaches utilized in ST result in effective management of a national program, despite facing numerous challenges, including budgetary constraints and limited capacity. The results of this review will encourage and motivate staff and ST leadership to continue to pursue excellence in all aspects of fish stock assessment.

Response to Recommendations and Other Observations

The review panel Chair provided a summary report of the program review, and the five other panelists provided detailed individual reports. We will use all of this valuable information in developing strategic and implementation plans that will establish future directions for ST's stock assessment program. Here, we synthesized the reports to develop responses to the major observations and recommendations that emerged. In general, if an observation or recommendation was present in the Chair's summary or in more than one of the panelists' reports, then we provided a response. Further, because we coordinate and manage the national stock assessment program, our future directions will also be informed by the overall national response to the program reviews, as well as the individual reviews conducted in the six science centers. Finally, any potential changes in programs or processes will occur under the direction of the NMFS Science Board (an authoritative body that includes NMFS' Chief Science Advisor, the six Science Center Directors, the ST Director, and the three Senior Scientists).

In the following section, we summarize the substantive points identified by reviewers into six themes and provide our response(s) to those points. In Table 1 we provide a summary and timeline for actions that we will take to address reviewer recommendations.

Strategic Planning and Alignment with Agency Priorities

Many panelists did not see clear connections between ST's stock assessment program and NMFS national priorities. They felt that ST could play a role in developing national priorities, communicating those priorities, and mapping ST's assessment-related activities to those priorities.

- During the review we focused primarily on ST's stock assessment program and we did not present and explicitly connect ST activities to all national-level strategic plans and priorities. We concentrated on the connections between our activities and the 2001 Stock Assessment Improvement Plan (SAIP), which is the guiding document for ST's

stock assessment program. ST is playing a central role in developing a new SAIP, and this document will become the key strategic plan for ST's stock assessment program. ST will ensure the revised SAIP is linked to current national priorities that are established in the Next Generation Strategic Plan, NOAA's Annual Guidance Memorandum, and NOAA Fisheries Priorities and Annual Guidance. ST will continue to align our program with those priorities, engage in the Agency's strategic planning process, and report on our major activities through quarterly and annual milestones that are directly linked to annual NMFS priorities.

- We will make improvements in linking the stock assessment program with NMFS priorities by meeting with the NMFS Science Board at the end of each fiscal year to plan and align investments in the coming fiscal year(s) with NMFS' Priorities and the next generation SAIP.

Panelists commented that it is important for ST to place a high priority on the consideration of ecosystem dynamics within a stock assessment context.

- We fully appreciate these comments as our current SAIP development efforts are heavily focusing on the importance of ecosystem dynamics. The panelists' comments further cement our intentions.

The panelists commented that development of a new SAIP is a critical activity for ST. Also, panelists recommended that ST consider more engagement with external stakeholders throughout this process.

- We agree with the panelists that it is crucial for ST to coordinate and facilitate this activity, and we also found the recommendation and encouragement to engage better with external stakeholders to be particularly helpful. We are aiming to develop a complete draft of the SAIP for stakeholder input by the end of FY2015. We are considering a range of options to receive this input, such as presentations to Fishery Management Councils via the Council Coordination Committee and/or Science and Statistical Committees.

Panelists stated that it is critical that we reestablish and continue hosting National Stock Assessment Workshops.

- There have been 11 National Stock Assessment Workshops (NSAWs) to date, but it has been five years since the most recent NSAW. Overall, these workshops have been important for maintaining and advancing a world class stock assessment program in NMFS. The 12th NSAW will occur in FY2015 and planning is now underway. Going forward, we plan to hold these workshops at least biennially.

Capacity Building and Career Development Opportunities for Stock Assessment Scientists

Panelists emphasized the need to expand capacity building and staff development activities. In particular, they recommended that ST should consider establishing a stock assessment training program for existing stock assessment scientists that offers continuing education opportunities, as well as orientation and training for new employees.

- We will develop, and present to NMFS Science Board, a plan to establish a stock assessment training and orientation program. Because one benefit of our NSAWs has been to create education and networking opportunities for stock assessment scientists, it may be prudent for this program to be directed under the NSAW umbrella. Additionally, we will explore whether our Quantitative Ecology and Socioeconomics Training (QUEST) Program, which historically has focused on graduate school training, can be expanded to include continuing education opportunities for new and existing staff.

Panelists further suggested implementing staff rotations between ST and the science centers to maintain ST staff participation in scientific activities and to provide experience to regional scientists with headquarters operations.

- ST management recognizes the importance of staff rotations and is supportive of utilizing such rotations as career development opportunities. We will develop, and present to NMFS Science Board, a plan for establishing a program and coordinating staff rotations within NMFS. We will consider the possibility of a “rotate-in-place” option, whereby two (or more) individuals share their responsibilities through regular communication and occasional visits, but without a temporary relocation.

Internal RFPs Administered by ST

We received a number of comments and recommendations surrounding ST’s RFPs. There are several RFPs managed by ST, and panelists recommended that we think strategically about the total number and how the RFPs align with NMFS’ Priorities, the possibility of integrating several or all into a single RFP, the need to standardize the process by which the RFPs are administered, and the number of working groups and level of expertise needed to administer the various RFPs. Panelists also recommended that we should maintain funding one- to two-year projects, but also consider regularly funding longer-term strategic initiatives (e.g., those implemented by the Advanced Sampling Technologies Program). Finally, many reviewers felt that ST should improve tracking and follow-up on funded projects to maximize use of research, facilitate a move from research to operations, and be able to assess the return on these investments.

- We will evaluate the overall benefits and efficiency of our stock assessment-related RFPs and seek to make improvements through potentially standardizing processes, ensuring alignments with NMFS’ priorities, consolidating RFPs where feasible and appropriate, and evaluating the number of working groups, the composition of those groups, and their RFP-related responsibilities.
- We will further improve the benefits of our assessment-related RFPs by continuing to improve tracking of funded projects and enforcing reporting requirements to track the deliverables of those projects. ST is currently developing a Program Information Management System (PIMS) that will result in substantial improvements in this regard. The PIMS will be a scalable, customizable, web-based, database-driven application that will allow ST programs to execute the full life cycle of RFPs, including proposal solicitation, project scoring via customizable evaluation criteria, capturing of budget decisions and accounting data, interim and final report generation, and metadata capture and publication in the NMFS Information Portal.
- We appreciate the recommendation to consider increasing our use of strategic initiatives and funding longer-term projects. This may represent the best approach to operationalizing important research products. To generate future strategic initiatives and fund longer-term operational projects, we will work with the Science Board annually to review NMFS’ Priorities, RFP-funded projects, and other sources of information to identify candidate projects for new strategic initiatives. Pilot studies may begin as early as FY2015.

NOAA Fisheries Toolbox

It was conveyed by the panelists that the NOAA Fisheries Toolbox (a project funded by ST that provides access to various stock assessment tools) should be thoroughly evaluated, including usage, importance, and the suite of tools provided to guide future investments and ensure that they align with overall need.

- The Assessment Methods Working Group, which is managed by ST, oversees the NOAA Fisheries Toolbox. This group is actively developing a strategic vision for the Toolbox and is communicating with potential partners and users to ensure that future efforts meet user needs. The Assessment Methods Working Group is seeking to improve the Toolbox by increasing utility and participation across regions, expanding portability of programs across operating systems, and facilitating community development of applications, documentation, and testing protocols. These enhancements will begin in FY2015.

The Stock Assessment Peer Review Process

ST coordinates the Center for Independent Experts (CIE), which provides rigorous external peer review of various science products, including stock assessments. Many panelists expressed in their reports that ST should work toward improving efficiency in the overall stock assessment review process by appropriately tailoring the level of review, using the CIE only when needed, and playing a significant role in developing and reviewing Terms of Reference for peer reviews to ensure that review processes are consistent and used appropriately.

- NMFS' various fishery management partners (Councils, Commissions, and international Regional Fishery Management Organizations) play significant roles in establishing stock assessment and review processes, including which stocks are in need of assessment. Thus, changing existing processes requires collaboration and agreement with our partner institutions. ST will continue to facilitate engagement with management organizations, where feasible and appropriate, to ensure that these processes improve through collaborative efforts.
- Many efforts currently underway in ST will directly address peer review of stock assessments. The new SAIP is being developed with particular attention to improving efficiency in the stock assessment and review processes, and the stock assessment program reviews conducted in NMFS' six science centers also focused on stock assessment review processes. ST is also helping to implement a national approach to prioritizing assessments, which will provide an objective basis for determining which stocks should be assessed and the level at which those assessments should be conducted. Assessment levels will be scaled to the need for each particular stock, and the level of review required can be scaled accordingly. Testing of this new protocol will begin in FY2015.
- Finally, ST currently reviews and approves each of the Terms of Reference associated with CIE reviews. Where appropriate, we will use the TORs to implement review processes that align with the need for a particular level of assessment.

Stock Assessment Communication

The panelists provided a number of recommendations regarding ST's communication efforts surrounding stock assessments. Many felt that ST should develop a strategic communication plan that aligns with and complements NMFS' regional communication strategies as well as strategies of the NMFS Office of Communications. Some panelists also recommended that ST help facilitate better internal communication within the agency to keep staff informed of major developments, priorities, ST's contributions to the stock assessment program, budget transparency, etc.

- One issue that was apparent during the program review was that ST has very limited capacity to support ongoing stock assessment communication and outreach. These reviewer comments extend beyond the stock assessment program and are relevant to ST's science communication in general. ST agrees with the panelist's recommendations

and comments, and we will seek to evaluate our overall communications strategy. The ongoing development of ST's communications strategy will occur in the context of the full five-year program review cycle, and in consideration of the mission and capabilities of NMFS Office of Communications to ensure that ST is in line with the existing national communication strategies. However, there are several stock assessment-specific activities that ST will undertake to improve overall assessment communication:

- ST is currently coordinating a Stock Assessment Communication Forum that includes stock assessment and survey representatives across all regions to discuss emerging issues and current events. To date, communication has largely remained within this group, but we will encourage broader distribution and potentially provide formal summaries throughout the agency, thereby improving internal communication.
- ST will also improve the dissemination of our quarterly stock assessment reports. These reports summarize recent stock assessment activity across the nation and they are made publicly available, but they are not currently distributed widely within NMFS.
- ST is currently conducting a significant overhaul of its stock assessment website and we will create a more user-friendly interface that includes new features, such as periodic updates, feature stories, and other tactics that will help ST reach a larger interested audience.
- ST will also seek to formalize other existing lines of internal communication with stock assessment staff in the science centers to improve the two-way dialogue between ST and the centers.

Several panelists emphasized that it is important for ST to develop more useful and responsive performance measures for evaluating the stock assessment program, and to test these measures before implementation to ensure that they respond as anticipated.

- ST is currently in the process of developing new performance measures for the stock assessment program. Because we are in a relatively early stage of development, we did not present our ideas and process in detail during the program review, although a description of tentative measures can be found in backup slides to the communications presentation. These new measures will be informed through linking the newly developed stock assessment prioritization protocol with an assessment categorization system being developed as part of the next generation SAIP. Simulation testing of these tentative alternative performance measures is ongoing. We expect that new measures will become operational in FY2016.

Conclusion

This review was the second in a series of annual reviews at ST and was focused on our stock assessment program. The observations and recommendations of the panel members provided valuable feedback on how this program is performing relative to our stated goals and objectives, and how it can be improved. Overall, panel members were overwhelmingly positive in their comments.

ST leadership agrees with the panelist's recommendations and is committed to implementing the suggested changes in existing, and sometimes new, activities to realize significant benefits and efficiencies. In several cases, reviewer recommendations and appropriate responses extended beyond the scope of ST's stock assessment program (e.g., reevaluating the full suite of RFPs, and the need for improved science communication). These larger scope actions will be considered in the context of the full five-year program review cycle and will be revisited once all

reviews are completed. Table 1 below summarizes ST's planned actions to address the reviewers' stock assessment program-centric comments and recommendations.

The results from this year's review, along with those being conducted at each of the six fisheries science centers, will be used to prepare a national summary, to highlight best practices, and to inform decisions on opportunities for improving stock assessment science programs across NMFS. The full suite of these reports will be found at: <http://www.st.nmfs.noaa.gov/science-program-review/>.

More information regarding the ST stock assessment program review may be found at: <http://www.st.nmfs.noaa.gov/science-program-review/st-stock-assessment-review/st-stock-assessment-program-review-2014>.

Table 1: Summary of New Action Items and Schedules for ST's Stock Assessment Program

New Action Item	Completion Schedule
We will meet with the NMFS Science Board at the end of each fiscal year to plan and align investments, such as initiation of longer-term operational projects, with NMFS' Priorities and the next generation SAIP.	FY15: quarter 4; then ongoing
We will develop a complete draft of the next generation SAIP to be submitted for stakeholder input.	FY15: quarter 4
We will hold the 12 th NSAW.	FY15: quarter 4; then biennially
We will develop, and present to NMFS Science Board, a plan to establish a stock assessment training and orientation program.	FY16: quarter 3
We will develop, and present to NMFS Science Board, a plan for establishing a staff rotations program.	FY16: quarter 1
We will improve the benefits of our assessment-related RFPs by continuing to improve tracking of funded projects and enforcing reporting requirements to track deliverables of those projects.	FY15: quarter 2, then ongoing
We will review our current RFPs to identify those projects that represent good potential candidates for new Strategic Initiatives.	FY15: quarter 4
We will establish the future direction for the NOAA Fisheries Toolbox.	FY15: quarter 4

New Action Item	Completion Schedule
We will continue to facilitate engagement with management organizations to ensure that stock assessment review processes improve through collaborative efforts.	FY16: quarter 2; then ongoing
We will improve dissemination of stock assessment-related information internally and externally via the ST website and other outlets.	FY15: quarter 3, then ongoing
New performance measures will be developed and used to evaluate NMFS' stock assessment program.	FY16: quarter 4